

## CLAIMS

1. A method for providing a visual representation of a spreadsheet, said method comprising the steps of:
  - identifying cells in the spreadsheet as data cells or calculation cells;
  - 5 identifying a collection of data entities and calculation entities for the visual representation, where each entity corresponds to one or more cells in the spreadsheet;
  - positioning the entities in a predetermined configuration;
  - connecting the entities by arrows based on their corresponding
  - 10 relationship in the spreadsheet to form the visual representation;
  - detecting changes in the cells of the spreadsheet; and
  - changing the entities in the visual representation to correspond to the detected changes in the cells of the spreadsheet to maintain a functional equivalence between the visual representation and the spreadsheet.
2. The method according to claim 1 wherein the step of changing the entities includes modifying the content of the entities to correspond to changes made in the cells of the spreadsheet.
3. The method according to claim 1 wherein the step of positioning the entities includes employing user interaction to configure the entities in a visually pleasing manner.
4. The method according to claim 1 wherein the step of positioning the entities includes employing an automatic design layout algorithm to configure the entities.

5. The method according to claim 1 wherein the step of identifying a collection of entities includes determining the appearance of each entity based on its function

6. The method according to claim 5 wherein the step of determining the appearance of each entity includes forming the data entities in one shape and forming the calculation entities in another shape.

7. The method according to claim 1 further comprising the step of creating multiple identical entities in the visual representation if data cells are repeatedly used in the spreadsheet.

8. The method according to claim 1 wherein the step of changing the entities includes automatically deleting entities from the visual representation in response to cells that are removed from the spreadsheet.

9. The method according to claim 1 wherein the step of identifying a series of entities includes determining descriptive labels for each entity that is identified.

10. A method for corresponding a visual representation and a spreadsheet, said method comprising the steps of:

identifying cells in the spreadsheet as data cells or calculation cells;

5 identifying a collection of data entities and calculation entities for the visual representation;

corresponding the data cells to the data entities and the calculation cells to the calculation entities so that the visual representation and the spreadsheet have a functional equivalence;

- 10 detecting changes in the cells of the spreadsheet and changes in the entities of the visual representation; and
- changing the entities in the visual representation to correspond to the detected changes in the cells of the spreadsheet and changing the cells in the spreadsheet to correspond to detected changes in the entities in the visual
- 15 representation so as to maintain a functional equivalence between the visual representation and the spreadsheet.

11. The method according to claim 10 further comprising the steps of positioning the entities in the visual representation in a predetermined configuration and connecting the entities together by arrows to define the functional operation of the visual representation.

12. The method according to claim 11 wherein the step of positioning the entities includes employing user interaction to configure the entities in a visually pleasing manner.

13. The method according to claim 11 wherein the step of positioning the entities includes employing an automatic design layout algorithm to configure the entities.

14. The method according to claim 10 further comprising the step of determining the appearance of each entity in the visual representation so that the data entities have one shape and the calculation entities have another shape.

15. The method according to claim 10 further comprising the step of creating multiple identical entities in the visual representation if data cells are repeatedly used in the spreadsheet.

16. The method according to claim 10 wherein the step of changing the entities includes automatically deleting entities from the visual representation in response to cells that are removed from the spreadsheet and automatically deleting cells from the spreadsheet in response to entities that are removed from the visual representation.

17. The method according to claim 10 wherein the visual representation is an influence diagram.

18. A system for corresponding a visual representation and a spreadsheet, said system comprising:

- means for identifying cells in the spreadsheet as data cells or calculation cells;
- means for identifying a collection of data entities and calculation entities for the visual representation;
- means for corresponding the data cells to the data entities and the calculation cells to the calculation entities so that the visual representation in the spreadsheet have a functional equivalence;
- means for detecting changes in the cells of the spreadsheet and changes in the entities of the visual representation; and
- means for changing the entities in the visual representation to correspond to detected changes in the cells of the spreadsheet and means for changing the cells in the spreadsheet to correspond to detected changes in the entities in the visual representation so as to maintain a functional equivalence between the visual representations and the spreadsheet.

19. The system according to claim 18 further comprising means for positioning the entities in the visual representation in a predetermined configuration and means for connecting the entities together by arrows to define the functional operation of the visual representation.

20. The system according to claim 18 further comprising means for determining the appearance of each entity in the visual representation so that the data entities have one shape and the calculation entities have another shape.

21. The system according to claim 18 further comprising means for creating multiple identical identities in the visual representation if data cells are repeatedly used in the spreadsheet.

22. The system according to claim 18 wherein the means for changing the entities includes means for automatically deleting entities from the visual representation in response to cells that are removed from the spreadsheet and automatically deleting cells from the spreadsheet in response to entities that are removed from the visual representation.